

What is claimed is:

1. An apparatus for separating carrier of multicarrier wireless communication receiver system, to separate  
5 multicarrier from a received signal, said apparatus comprising:

an internal oscillating unit for generating internal multicarrier;

10 a plurality of frequency transition units for respectively down-converting the multicarrier generated by the internal oscillating unit and moving it to frequency of "0" as a frequency center; and

15 a plurality of filtering units for individually filtering the respective carrier moved by the plurality of frequency transition units to the frequency center as the frequency of "0", through a low frequency pass band and for providing it as an input of a rake receiver.

20 2. The apparatus of claim 1, wherein said internal oscillating unit comprises:

a constant containing an increase value of each generation carrier;

an accumulator for accumulating constant values of the constant every clock;

25 a reset for initializing the value when the value of the accumulator exceeds one cycle of sine wave;

a plurality of delays for keeping the values of the

accumulator and returning the values to the accumulator in  
resetting;

10 a multiplexer and round for multiplexing an output value  
of the plurality of delays and rounding it off;

5 a lookup table having a storage of a sine value, for  
outputting a sine value corresponding to each carrier with an  
address as the value rounded off by the multiplexer and round;  
and

10 a demultiplexer for demultiplexing the sine value and  
outputting a sine signal of each carrier frequency as an  
oscillating signal.

15 3. The apparatus of claim 2, wherein said reset wraps the  
address of the lookup table having the storage of the sine  
signal as the sine wave by using only upper two bits.

20 4. The apparatus of claim 2, wherein said lookup table  
requires 4 x 96 having addresses of the 96 number to satisfy  
an output allowance error of 4 bit, but uses a 4 x 97 lookup  
table, into which a value equal to a 0<sup>th</sup> address is entered a  
97<sup>th</sup> address, for the sake of a preparation of the rounding-  
off.

25 5. The apparatus of claim 1, wherein said internal  
oscillating unit comprises by a plural number:

constants containing the increase value of each  
generation carrier;

5 accumulators for accumulating the constant values of the constant every clock;

resets for initializing the value when the value of the accumulator exceeds a constant value, preferably, one cycle of  
5 the sine wave;

delays for keeping the values of the accumulator and returning the values to the accumulator in resetting;

rounds for rounding the output value of the delay off;  
and

10 a plurality of lookup tables having the storage of the sine value, for outputting the sine value corresponding to each carrier with the address as the value rounded off by the round.

15 6. The apparatus of claim 5, wherein said reset wraps the address of the lookup table having the storage of the sine signal as the sine wave by using only upper two bits.

20 7. The apparatus of claim 5, wherein said lookup table requires  $4 \times 96$  having addresses of the 96 number to satisfy an output allowance error of 4 bit, but uses a  $4 \times 97$  lookup table, into which a value equal to a 0<sup>th</sup> address is entered a 97<sup>th</sup> address, for the sake of a preparation of the rounding-off.

25 8. The apparatus of claim 1, wherein said plurality of frequency transition units use six multipliers and make

frequency electricity of each carrier same in order to make the frequency down-adjusting number equal, to thereby control electricity of the carrier easily.

5        9. The apparatus of claim 8, wherein said plurality of filtering units are a 64 tap low frequency band pass filter of a 6bit filter input as an FIR filter for converting 6 bit input as a complement type of 2 into six single bits, processing a low frequency band pass filter (FIR filter) computation of several single bit inputs in one independent filter, and accumulating them in six of bit units, to finally output a filter output value of 6bit input, even without using the multiplier.

10        10. The apparatus of claim 9, wherein said low frequency band pass (FIR) filter comprises:

15            six 64bit shift registers for making 6bit filter inputs as the complement type of 2, single bit, and shifting and storing them;

20            a selector for selecting one out of input data stored at six 64bit shift registers;

25            an address generator for generating the address so as to be matched with the lookup table divided into the eight number by using input data selected in the selector;

30            a lookup table divided into the eight number with the address generated in the address generator, each lookup table being reduced in a size thereof by using a symmetry provided

within the lookup table;

5 a computing part for computing outputs of eight lookup tables by a most significant bit (MSB) control of each lookup table address, adding up them, and thereby generating filter outputs corresponding to respective filter input bits; and

an accumulator for right-shifting the filter output per bit and accumulating by the number of coefficients.

10 11. The apparatus of claim 10, wherein said address generator is constructed by exclusive logical sum (XOR) gates for performing an exclusive logical sum (XOR) computation by using a most significant bit (MSB) of an inputted address, in order for an access to an address of an omitted lookup table by using a symmetry within the lookup table.

15 12. A method for separating carrier of a multicarrier receiver system in a receiver of a wireless communication 3X, comprising the steps of:

20 using intact the existing 1X method for one carrier; and performing a down-conversion one more when its neighboring rest two carriers are separated, to thereby move its values to a center thereof and perform a separation,

25 in order to separate the carrier in the 3X receiver and gain information from the carrier, said separation of each carrier being executed after a quantization.

13. The method of claim 12, comprising the steps of

making the down-conversion number of three carriers equal, and moving the values to a center and performing the separation, in order to separate three carriers and gain the information from the carrier.

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